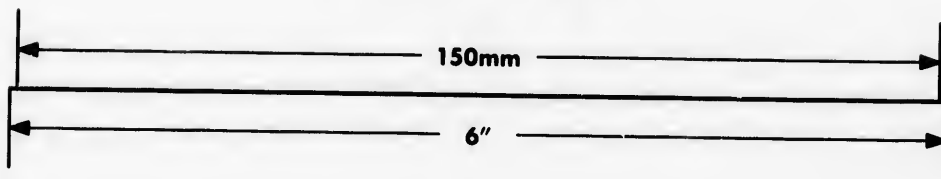
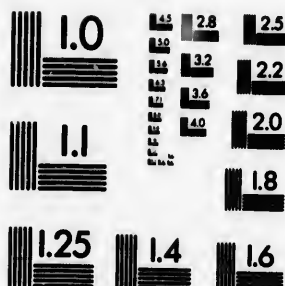
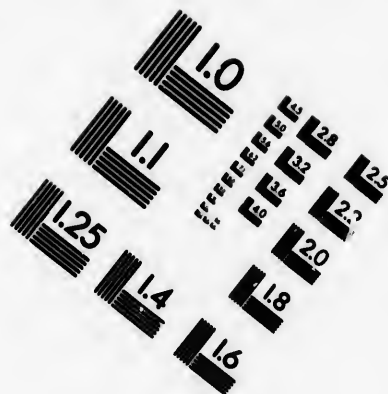
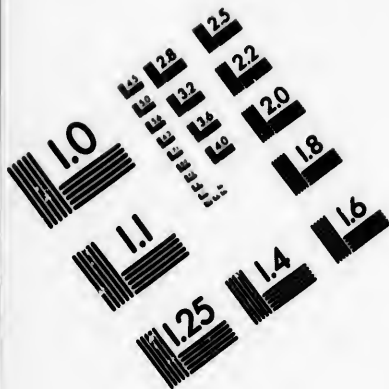
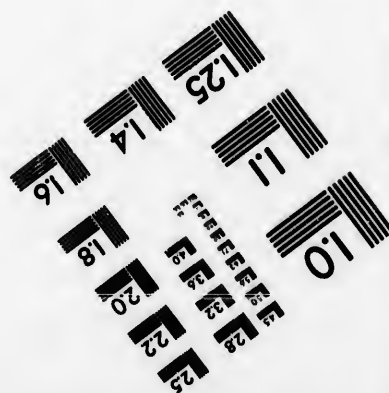


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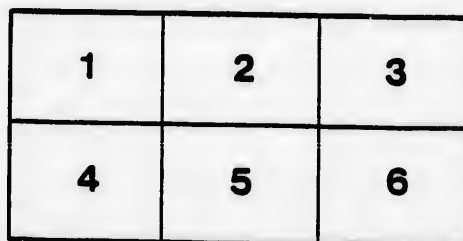
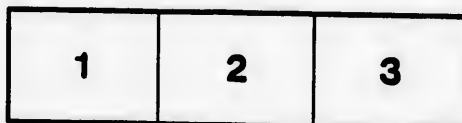
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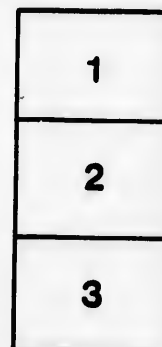
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DEPARTMENT OF AGRICULTURE.
CENTRAL EXPERIMENTAL FARM.
OTTAWA, CANADA.



Tumbling Mustard, flowering plant.

BULLETIN No. 28.

W E E D S.

To the Honourable

The Minister of Agriculture.

SIR,—I have the honour to submit for your approval Bulletin 28 of the Experimental Farm series on "weeds." This has been prepared under my direction by Dr. James Fletcher, the entomologist and botanist of the Dominion Experimental Farms. The annual losses which occur from the inroads of pernicious weeds are much larger than is generally realized, and where a proper course of treatment is adopted, these losses can be materially lessened. The increased interest which has of late been manifested in this subject by farmers generally augurs well for the future. In the present bulletin most of the noxious species are referred to, and short descriptions given of their appearance and habits, accompanied in many cases with figures which will, it is believed, lead to their easy recognition. Associated with the descriptions of the various species will be found the treatment best adapted for their extirpation. It is hoped that the publication of the information contained in this bulletin will bring about a more general and active war against pernicious weeds, which would undoubtedly result in much benefit to the agricultural community.

I have the honour to be,

Your obedient servant,

WM. SAUNDERS,

Director Experimental Farms.

OTTAWA, 27th July, 1897.

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THE WORST CANADIAN WEEDS.

There are many definitions of the word weed, but perhaps from a farmer's standpoint the best one is: "any troublesome or unsightly plant that is at the same time useless or comparatively so." As a general statement, it may be said that our most troublesome and aggressive weeds of the farm have been introduced into Canada from other countries; but, at the same time, it is also true that under special circumstances some of our native wild plants may increase and become "noxious weeds." It must be acknowledged that in all parts of Canada weeds are a source of constant and very considerable loss to farmers. Indeed, so much is this the case that the great prevalence of some varieties in certain districts of the Dominion must be viewed with the gravest alarm, for they have taken such possession of the land as to seriously affect profitable farming. As examples of such aggressive enemies, mention may be made of the Wild Mustard, Quack or Couch Grass and Canada Thistle in parts of almost every province, Ox-eye Daisy in the Maritime Provinces, Penny Cress or Stink-weed in Manitoba, and Tumbling Mustard in Manitoba and the North-west Territories.

The increase of weeds has been frequently due to the fact that farmers have neglected them from not being aware of their noxious nature and power to spread.

The following true statement occurs in an excellent pamphlet "Noxious Weeds in Manitoba and How to Destroy Them," issued by the Provincial Department of Agriculture and Immigration of Manitoba:—"Many of our farmers have only a limited knowledge of weeds, and in many cases do not recognize those that are dangerous on their first appearance. Hence we have 'One year's seeding, seven years' weeding.' There are some weeds so noxious that if farmers knew their real character and recognized the plants on their first appearance, they would postpone all other business until they were destroyed * * * * * Self-interest should be a sufficient incentive to farmers to destroy weeds if it is clearly shown that it will pay them to do so."

Another point of considerable importance with regard to noxious weeds is the adoption, as much as possible, of some one English or common name. The names used in this pamphlet have been selected with much care as to those which are most applicable and most widely known. When more names than one are given, the first is preferable. The scientific names, of which only one for each plant is recognized as authoritative by botanists all over the world, are here given, so that the certain identity of each plant mentioned may be known. Few farmers, of course, are acquainted with these scientific terms, even in the case of our commonest weeds, but it would be well if they were; for certainly much confusion exists in different localities in the application of the English popular names, the same plant being frequently called by one name in one place and by quite a different one somewhere else, or quite as frequently a single name is applied to a number of distinct plants in different places or by different people in the same place. The advantage, or even necessity, of calling a plant by its proper name has been forcibly illustrated in the case of the Tumbling Mustard, now so prevalent in many parts of Manitoba and at Indian Head, &c., in the North-west Territories. This most injurious weed was for some time after its introduction, spoken of generally as 'Tumble Weed,' a name properly belonging to a much less aggressive plant, the *Amarantus albus*, one

of the Pigweeds. Owing to the use of this wrong name, little effort was put forth by the settlers to destroy the new enemy, because it was well known all through the west that the true Tumble Weed was a native plant which had never given much trouble. Similarly, the Hare's ear Mustard, a very noxious weed, was left undisturbed by some from having been wrongly spoken of by many as "Black Mustard." The Black Mustard, as a matter of fact, is of very rare occurrence in Canada, and as far as I am aware is not anywhere in the Dominion a troublesome weed in crops.

The present bulletin is issued in response to numerous inquiries as to the nature of the many weeds found on farm lands and the best way of getting rid of them. While it is true that the character of each kind has to be considered, there are certain principles which must be constantly borne in mind by those who wish to clear their land of noxious weeds. In the present age of extensive and easy communication with all parts of the country, and indeed with the whole world, there are frequent opportunities for seeds of weeds being introduced into previously uninfested districts. As an offset against the great benefits we derive from railways, it has been found that many new weeds have been introduced into new localities through their agency, the seeds being either shaken from cars or cleaned out of them at stopping places. It is important, therefore, to keep watch on all railway banks, and station yards.

There are many ways by which weeds are spread:—

1. By natural agencies. The wind carries seeds long distances, not only in summer, but with dust and over the surface of the snow in the winter. Streams distribute them far and wide along their courses. They are also distributed by seed eating birds and herbivorous animals, through the stomachs of which the seeds have passed undigested, or by being attached to some part of their bodies by special contrivances, with which nature has provided some seeds for this very purpose, such as hooked and barbed hairs, spines and gummy excretions, &c.

2. By human agency. The seeds of weeds are frequently introduced as "foul seed" mixed with other seeds; they are also imported in hay used for packing or as fodder. In addition to this, weeds are frequently distributed over farms by waggons, harrows, seeders, threshing machines or other agricultural implements. Perhaps the most fertile source of weeds upon a previously clean farm, is manure brought from elsewhere. But, notwithstanding all efforts to the contrary, weeds will certainly be introduced from time to time on to the farms of the most careful, and the wisdom is therefore apparent of farmers becoming acquainted with the different kinds which are likely to cause them loss, and the best way to treat them.

In the following pages will be found short accounts of some of the worst weeds of the country, arranged according to their natural orders, so as to bring together those which are most nearly related.

Weeds, like all other plants, may be simply classified under the three following heads:—Annuals, or one year plants; Biennials, or two year plants; and Perennials, or many year plants. In eradicating weeds, it is of the greatest importance to consider under which of these heads they come, because in most instances the treatment is simple and will be upon the general principles of preventing annuals and biennials from seeding, and perennials from forming new leaves, roots and underground stems.

ANNUALS—Are those plants which complete their whole growth in a year. As a rule, they have small fibrous roots and produce a large quantity of seed. Examples of this class are found in Wild Mustard, Penny Cress (called in Manitoba "Stink-weed"), Lamb's quarters, Wild Buckwheat, Purslane, Ragweed, Wild Oats. There are also some annuals called "Winter Annuals," which are biennial in habit, that is, of which seeds ripened in the summer produce a certain growth before winter sets in and

then complete their development the following spring. Of these may be mentioned Shepherd's Purse, Pepper grass, Penny Cress, mentioned above, and the Blue Bur.

BIENNIALS—Are those plants which require two seasons to complete their growth, the first being spent in collecting and storing up a supply of nourishment, which is used the second season in producing flowers and seeds. Examples of these are Burdock, Mullein, Evening Primrose and Viper's Bugloss or Blue-weed.

PERENNIALS—Are those plants which continue growing for several years. Perennial weeds are propagated in several ways, but all produce seeds as well. They have two distinct modes of growth, those which root deeply, and those of which the root system is near the surface. The most troublesome are those which extend long under-ground stems down beneath the surface of the ground, as Canada Thistle, Perennial Sow-thistle, Showy Lettuce, and wild Sunflowers. Representatives of the second class or shallow-rooted perennials are: Pasture Sage, Yarrow and Couch Grass. Some perennials extend but slowly from the root by means of short stems or offsets; but produce a large quantity of seed. Of these, Ox-eye Daisy, Dandelion, Golden Rod and Yarrow are examples.

In adopting a method of extermination, the nature of the plant to be eradicated must, first of all, be taken into consideration. Any method by which the germination of the seed in the soil is hastened and then the young plants are destroyed before they produce fresh seed, must in time clean land however badly infested with annual weeds. The seeds of some annuals have very great vitality, and will continue appearing for several years as fresh seeds are brought up to the surface by cultivation. Wild Mustard and Wild Oats have been known to germinate after lying deep in the ground for twenty years. Biennials must be either ploughed up or cut off before they flower. Mowing at short intervals will kill them; but a single mowing will only induce them to send out later branches, which, if not cut, will mature many seeds. Where ploughing is impracticable, this class of plants should be cut off below the crown of the root. For this purpose a spud or a large chisel in the end of a long handle (to obviate the necessity of stooping) is as convenient a tool as can be used. Perennials are by far the most troublesome of all weeds and require very thorough treatment, in some instances the cultivation of special crops, to ensure their eradication. Imperfect treatment, such as a single ploughing, frequently does more harm than good, by breaking up the underground stems and stimulating growth.

There is no weed known which cannot be eradicated by constant attention, if only the nature of its growth be understood. Farmers should be constantly on the alert to prevent new weeds from becoming established on their farms. There are some general rules which all should remember:—

- 1.—Weeds do great harm by robbing the soil of the plant food intended for the crop and also of its moisture.
- 2.—Weeds crowd out and take the place of more useful plants, being hardier and, as a rule, more prolific.
- 3.—Weeds are a source of great loss to farmers as they require much labour and time to eradicate, and frequently compel them to change the best rotation of their crops, or even perhaps to grow crops which are not the most advantageous.
- 4.—All weeds bearing mature seeds should be burnt, and under no circumstances should they be ploughed under.
- 5.—Weeds of all kinds can be eradicated by constant attention and by adopting methods in accordance with their nature and habits of growth: Therefore,
 - (a.)—Never allow them to seed;

(b).—Cultivate frequently, particularly early in the season, so as to destroy seedlings while of weak growth ;

(c).—For shallow-rooted perennials, either trench the land deeply or plough so lightly that the roots are exposed to the sun and dry up; for deep-rooted perennials, the only means of destroying them is to prevent them from forming leaves and thus storing up nourishment in their root-stocks, to sustain future growth. This can be done by constant cultivation. The importance of leaves to plants can be seen by the serious injuries frequently inflicted even upon large forest trees by the destruction of their leaves by insects. The American larches, over thousands of acres in Canada, have been destroyed during the last ten or twelve years by having most of their leaves eaten by the imported larch saw-fly. Fruit trees stripped of their leaves by caterpillars during one season seldom mature a good crop of fruit the next year.

All weeds can be destroyed by the use of the ordinary implements of the farm, the plough, the cultivator, the spud and the hoe; but some experience is necessary to know what is the best time to work certain soils or to deal with special weeds. No general rules can be given, as the necessary treatment will vary in different districts on different soils and under different climatic conditions. What may be the proper treatment in one place may fail in another. Perennial plants, if allowed to develop flower stems and then ploughed down (or first mowed and then ploughed under), will by the production of the flower stems, have so far reduced the nourishment stored up in the rootstocks that they are much weakened and can afterwards be easily dealt with. On the other hand, it is found in the West, that all the weeds and other plants decay readily if prairie land or meadows be broken in May or early June. Land so treated can therefore be cleaned far more easily than if the operation of breaking is delayed until July. This is due to the climate and the succulent nature of all parts of the plant at that season.

SUMMER-FALLOWING.

As an agricultural practice, although not adopted to any large extent in the older provinces, summer fallowing is essentially necessary in Manitoba and the North-west Territories, where the conservation of moisture in the soil is of the utmost importance, the farms are large, labour is scarce and the time for preparing the land in autumn and spring is very short. The question is so often asked whether this practice is a wise one that I submit herewith extracts from four replies from men of much experience and who, in my judgment, were the best qualified to give useful and authoritative advice upon this subject.

Mr. Angus Mackay, Superintendent of the Experimental Farm for the North-west Territories, at Indian Head, says :—

"Summer-fallowing is absolutely necessary in the West to ensure a crop and get the work done, owing to the shortness of the time available in the fall and spring. All land intended to be cropped should be summer-fallowed the year before. This will get the land into good condition, keep down weeds and produce the best results in every way. Summer-fallowing is generally started too late in the summer. It should be begun as soon as possible after seeding in the spring, so as to get the full advantage of the spring rains. As a rule, one ploughing only is advisable, because in wet years two deep ploughings would produce too much growth and retard the ripening of the grain. If the land should be weedy, the proper way to keep it clean is to harrow two or three times after ploughing. If farmers are willing to risk getting a smaller crop by sowing on stubble so as to get the grain to ripen earlier and in windy sections to avoid the danger of blowing, the proportion so treated should never exceed one third of their land.

Mr. S. A. Bedford, Superintendent of the Experimental Farm for Manitoba, at Brandon, Man., says:—"In regard to summer-fallowing: I consider it is absolutely essential on farms outside of the Red River valley, where, however, the advantages are not so clearly apparent, but even there I contend that the farmers would be benefited from a proper fallow every three or four years; too frequent fallowing in the Red River valley causes very rank vegetation and lodged grain. On our lighter and better drained soils this seldom occurs. Unfortunately, in this country much of the so-called summer-fallowing is badly done."

Mr. Hugh McKellar, Chief Clerk, Department of Agriculture for Manitoba, commenting upon a statement made by a Manitoba farmer that he could not afford to allow his land to lie idle as a summer-fallow for a year, says:—

"Some farmers say they cannot afford to summer-fallow. I may say farmers cannot afford *not* to summer-fallow, for it is done by horse-power, of which they generally have a supply on hand at that time of the year, with sulky or gang ploughs, by which they will plough from five to seven acres a day with four or six horses. In some of the wooded parts of the province, however, the land under cultivation by farmers is restricted in area. If a farmer has only forty or fifty acres under cultivation, he might well crop all of it every year, each year having a few acres of roots or corn, but on those large farms, such as you passed through with me out at Wawanesa, Souris or Hartney, where farmers crop 300 or 400 acres or more each year, it would be useless to crop a field of 150 or 200 acres with roots or ensilage corn. Such a field would feed 150 head of cattle for a year, and as you know the cattle are not yet in the country. Summer-fallowing, properly done, that is, ploughed early and kept clean afterwards, is in my opinion the only way in the west to keep down the many noxious weeds which would otherwise become our masters, and I may say this is the method followed by our most practical farmers."

"Our farmers are now learning the importance of knowing the different weeds and fighting them according to their different natures, but in this country some weeds are extremely persistent and hard to control. The natural conditions are all in favour of the weeds, but their eradication is only a matter of diligent, careful work and all the weeds, even the worst, can certainly be kept in check."

The Hon. Thomas Greenway and the officers of his department have taken active measures to prevent the spread of these enemies of the farmer in Manitoba by publishing bulletins and holding meetings throughout the province where the different kinds of dangerous weeds have been described and the best way to fight them explained.

Mr. Richard Waugh, Editor of the *Nor-West Farmer*, says:—

"The general experience of the best class of farmers in Manitoba and the Territories goes to show that for wheat growing especially, summer-fallowing, if properly done, is a great benefit. One strong point in its favour is that it can be best done at a season when no other work is pushing. Many mistakes have been made in doing this kind of work. But within the last two years careful observations and free discussion in farming papers and at farmers' institutes have led to practical unanimity as to the way in which it can be done with the least possible amount of labour, the best time and way to do it, and the results that may be reasonably expected from timely and well done work."

"Men with ripe Ontario experience began, as a rule, by ploughing twice, and occasionally even thrice. But it was soon found that this plan of action led to an overgrowth of straw, later ripening and an inferior quality of grain. I have for the last ten years been advocating one ploughing, going, if necessary, an inch deeper than any former ploughing

on the same land, for nearly all the land now likely to be benefited by it. I urge that the harrow shall follow the plough, so as to preserve all the moisture and at the same time start into free germination all the foul annual seeds then in the soil, repeating the harrowing as often as the weeds show up in the seed leaf. This consolidates the lower stratum of the soil while killing out all the foul seeds and at the same time putting the land in better condition for preserving all the sap. If there has been a wet spell in summer (a rare thing here) and the weeds get a start, a skinning with the spade cultivator or similar appliance on a warm dry day will be needed, as after the weeds have got a good start harrowing will help rather than hinder them.

"Land thus treated will start the grain next spring earlier and more evenly than any other, the crop will ripen faster with a full yield of the best grade of wheat that Canada is fit to produce. If the land is infested with Thistles or Stink Weed there must be some modification of this plan. For Stink Weed and other noxious annuals, I would follow the same course, but keep stirring the surface more, so as to work out all the foul seeds I could in the topmost two or three inches, and while ordinary annual weeds might be let grow after August, I would keep stirring for Stink Weed until snow came. If any plant of Stink Weed is left alive in the fall it will live on all winter under the snow and start early in the spring, often overtopping the grain crop in May. I will not now go over the whole case for or against summer-fallowing. Green cropping may help in a rotation of crops that would enable us to dispense to that extent with fallow work, and there must be a difference in the treatment for such perennials as Couch Grass and Thistles; but when farming is to be done on hundreds of acres with a very limited working force I hold that wheat cannot be profitably grown without summer-fallowing, and the live question for to-day is not whether we shall summer-fallow, but how it can be best and most cheaply done to suit the purpose."

Through the kindness of the Honourable Minister of Agriculture for the Province of Manitoba I have had exceptional opportunities, during the past three summers, of travelling through all the important wheat growing districts of that province. It was very apparent to me during these visits that in many instances summer fallowing was begun much too late in the season to get the best results as to weed eradication. By the middle of July several kinds of the most noxious annual weeds have developed their seeds sufficiently for these in the dry climate of Manitoba to ripen beneath the soil, even when ploughed well under out of sight, which, however, is by no means always done. There is always of course a temptation to put off the ploughing of land which is to be summer-fallowed as long as possible so as to reduce the subsequent labour of cultivating and harrowing. From a careful study of the development of weeds on summer-fallows in Manitoba for three summers I believe that to obtain the best results in the eradication of such early-ripening plants and annual weeds as Stink Weed, False-flax, Ball Mustard, Pepper-grass, Shepherd's Purse, Blue Bur, Golden Fumitory, etc., all summer-fallowing should be completed if possible not later than 12th of July, so that no risk may be run of ploughing down mature seeds.

SEEDING DOWN.

The prevention of seed-production is of great importance when clearing land of weeds. Many weeds may be held in check to a large extent, particularly upon land, which is not required for cropping, by seeding down to grass or clover, but, of course, any ripe seeds of weeds which are in the soil, will germinate as soon as the land is broken up again. But in the same way that weeds crowd out crops and reduce the yield of seed, so may

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weeds themselves be choked by a more vigorous plant, which will prevent them getting light and air such as the free-growing grasses, millet, buckwheat, clovers, or even a thickly sown grain crop. This treatment will destroy the seedlings, which appear at the same time as the crop sown, and thus prevent them producing other seeds. When the land is ploughed again, those weed seeds turned up near enough to the surface to germinate, must be killed by the frequent use of the cultivator, harrow or weeder.

An excellent plan of smothering out a restricted patch of any troublesome weed, frequently practised in Manitoba is to build a straw stack over the spot; a manure pile is used in the same way in the east.

THE USE OF CHEMICALS.

The killing of weeds by the application of chemicals is not often a practical remedy, but salt, coal oil, sulphuric acid and carbolic acid have been used successfully on limited areas. Salt, however, has given excellent results when applied to land infested with the Orange Hawkweed or "Paint Brush" in the State of Vermont and in the Eastern Townships of the province of Quebec. Salt is also very useful for the destruction of many kinds of weeds on gravel walks. Mr. F. T. Shutt, Chemist to the Dominion Experimental Farms, recommends the following for destroying weeds upon gravel walks: 1 lb. white arsenic; 2 lbs. washing soda; 3 gallons of water. Boil and dilute with three times the volume of water. Apply while warm in fine weather. A thorough application at the beginning of the season will be sufficient to keep a path clean throughout the summer. A simpler and a very effective formula is as follows: 2 lbs. blue vitrol; 6 gallons of hot water, dissolve in a crock and apply as above. Mr. L. A. Dewey, Assistant in the United States Division of Botany, says, when speaking on the use of chemicals:—"A few drops of carbolic acid applied at the base of the main stem with an ordinary machine oil can is the best method that has, as yet, been devised for killing weeds with chemicals." But, on the whole, the use of chemicals as weed destroyers has not given much satisfaction, owing to their cost and the expense of applying them.

Names given to some of the different arrangements of the flowers in plants, which for the sake of brevity it is necessary to use in the following list, are as follows:—

A *Spike*, when the flower stalks are very short or wanting altogether, example Plantain, Wheat.

A *Raceme* differs from a spike in the flowers being borne upon foot-stalks of an equal and of a noticeable length, example Lily of the Valley.

A *Panicle* is a compound raceme or a raceme with branched foot-stalks; example, Oats.

A *Corymb* is a raceme in which the footstalks are gradually lengthened from the apex downwards, so that all the flowers are brought to the same level, or nearly so; example, Groundsel.

A *Cyme* is a panicle with the foot-stalks so developed or contracted as to form a flat-topped head, the central flowers generally blooming first; example, Elder, Dogwood.

A *Head* is when numerous flowers are arranged upon a disk or receptacle; example, Ox-eye Daisy.*

An *Umbel* is when all the flowers are supported upon foot-stalks of equal length; example, Geranium. If each of the foot-stalks of an umbel bears a secondary umbel as in the carrot, it is a *compound umbel*, and, indeed,

* In the following table of weeds, the heads of flowers of plants of the Sunflower Family are treated of as if they were single flowers.

most of the forms above mentioned by repetition upon themselves become compound.

The plants mentioned in the following list are those which have been most frequently inquired about by my correspondents. Those preceded by an asterisk are "bad weeds" and care should always be taken to destroy them whenever they are noticed. There are many others which might have been included in a full list of the weeds of Canada, but in nearly every case these are so similar to allied species treated of here that to prevent

confusion it was thought best to omit them, unless they had been actually inquired about. The Botanist will at all times be pleased to hear from correspondents concerning weeds, and will give all information in his power on their habits, and the best means of eradicating them. It is particularly requested that when inquiries are made about weeds or their seeds, samples may be sent for examination. Such samples and all correspondence referring to them may be sent FREE by post, and will be promptly attended to.



Tower Mustard.

SOME WEEDS OF SPECIAL INTEREST.

Large numbers of specimens of plants found growing in field-crops or gardens are every year sent to the botanist for identification or for advice as to the best means of eradicating them. Figures have been prepared of some of the kinds most frequently inquired about and they are submitted herewith. These plants are not all among the most aggressive enemies of the farmer, but the numerous demands for information concerning them seem to make it advisable that recognizable figures should be published.

TOWER MUSTARD.

This is a tall slender plant 2 to 4 feet in height, with small yellowish white flowers which are followed by a great many slender pods 3 inches long, borne erect and closely pressed to the stem. The root-leaves are hairy, but all the rest of the plant is very smooth and glaucous, that is, covered with a whitish bloom as seen on cabbage leaves. This is not a very troublesome weed. It has been sent in as occurring in summer fallows in Manitoba and in clover fields in the older provinces.

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Hare's-ear Mustard.

HARE'S-EAR MUSTARD.

This is an introduced European plant which has only appeared as a noxious weed in the grain fields of the west during the last five years, but has already spread widely through Manitoba and the North-west Territories. It is an extremely injurious plant with large grayish green succulent leaves like those of a young cabbage, which chokes out grain and absorbs much moisture from the soil. The ripe stems are wiry and stiff, growing sometimes 4 feet high and giving trouble when grain is harvested. It is a slender branching annual and takes its name from the oblong-oval leaves of the stem, which are shaped like a hare's ear.

TUMBLING MUSTARD.

I have no hesitation in calling this the worst weed we have in Canada. It is only about 10 years since it was first noticed as a troublesome pest of the farm and although great efforts have been made to control it, it has gradually spread over hundreds of thousands of acres in the North-west Territories and Manitoba. It has all the bad characteristics of the other mustards and besides is a large, free-growing, exceptionally prolific plant, of which, when the seeds are ripe, the head breaks off and then becomes a

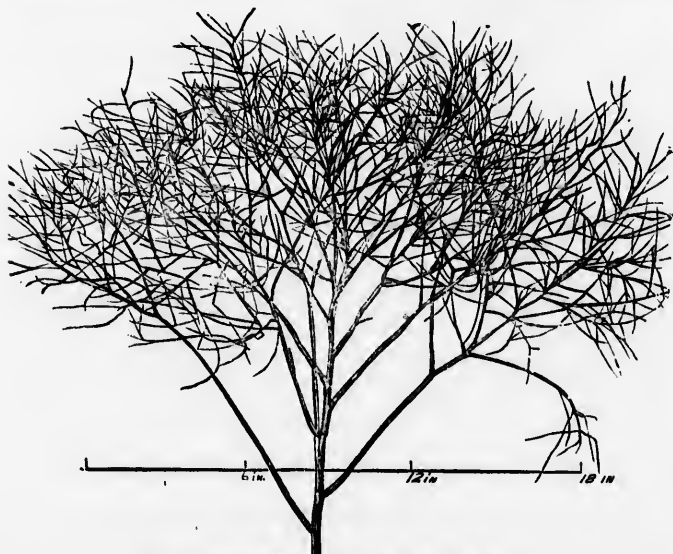
"tumbling weed" being blown for miles across the prairies in autumn and



Tumbling Mustard, Seedling.

ly and producing their tall flowering stems covered with pods about 3 inches long, each one of which contains about 120 seeds. A single plant sent from Indian Head, N.W.T. bore more than one million and a-half seeds. The seeds are very small, about half the size of timothy seeds and are of a reddish or greenish brown colour.

during the winter and in that way scattering these seeds quickly over wide areas. The leaves of the young plants are quite different from those borne on the stems which are divided up into thread-like divisions as shown in the figure of a flowering plant on the frontispiece. Normally this plant in its home, the south of Europe, is a winter annual, the seeds germinating one season and the plants not flowering until the next year. This is also the case occasionally in Ontario and the North-west; but for the most part in North America, it is a true annual, the seeds germinating in spring, the plants developing quickly



Tumbling Mustard: a tumbler with ripe seeds.

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Stink Weed.

come in contact and are thus distributed widely and easily by sticking to the feet of animals and to farm implements.

STINK WEED.

No weed is better known in Manitoba than this with its early ripening, yellowish, flattened pods, each one about the size and shape of a five cent piece and containing 16 seeds. The rank, nauseous odor of this plant, the rapidity with which it spreads, and the almost incredible difficulty of eradicating it when once established, make it important that its appearance should be known to everyone, so that no effort may be spared to destroy every plant as soon as noticed. Seeds germinate in autumn and plants actually in flower when winter sets in, will mature their pods the following spring. There are frequently two crops of seed in a season. The only way to clean land of this pest is to adopt some treatment by which the seeds are made to germinate and the young plants are destroyed before they can ripen fresh seeds. Plants with fully formed pods should never be ploughed in, and when plants are mowed they should be burnt as soon as they are dry enough. The seeds are very dark brown, flattened, beautifully marked with concentric grooves on the surface. When wet they are covered with a jelly-like coating by means of which they adhere to any object with which they



Ball Mustard.

BALL MUSTARD.

This is one of the new weeds in grain fields. From the rapidity with which it has spread all through the west, there is no doubt that it is a weed which must be fought vigorously by farmers. It is alarmingly abundant in Manitoba and the North-west Territories wherever wheat is grown. Specimens have also been received from British Columbia, Ontario and Prince Edward Island. Ball mustard is a rather slender erect annual (or winter annual) two or three feet high. The leaves on the stem are arrow-shaped and are covered with star-shaped hairs. The flowers are orange yellow, so that the plant is easily recognized at a distance when growing in a crop; they are about $\frac{1}{2}$ of an inch in diameter and are borne in clusters at the ends of the branches. The small roundish, single-seeded pods on slender footstalks are borne thickly all along the gradually lengthening branches.

The cut shown herewith has been kindly loaned by the United States Department of Agriculture, and was first used in Circular No 10 by Mr. Lyster H. Dewey, "Three New Weeds of the Mustard Family" to whom our thanks are tendered.

The cut shows at *a* the tip of a plant a quarter of the natural size, at *b* a pod natural size and at *c* a seed enlarged.

PEPPER GRASS.

This plant is a native annual or winter annual. As a rule it is not very troublesome in crops: but under certain climatic conditions it becomes an enemy of no small importance. During 1896



Pepper Grass.

minated plants which are the ones most likely to do harm in wheat crops.

no weed was more frequently sent in as a pest in wheat lands, and at meetings of farmers held during the same summer in Manitoba, this weed above all others was the one inquired about. At similar meetings in 1897 it was only mentioned once, viz., at Glenboro, Man. Pepper grass is a slender herb 12 to 18 inches high, which develops in the shape of a miniature tree with a central stem and a large spreading head. It produces an enormous quantity of very small reddish seeds, two in each of the small, flat pods which are borne thickly all along the branches. This plant is generally most troublesome after wet springs on dry or light land, occasionally a serious pest in Manitoba and much complained of by farmers in wet springs, particularly in wheat sown on stubble. Although generally described as an annual, pepper grass, is much more of a biennial in habit. Fall and spring ploughing or cultivating will destroy those autumn-ger-

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COW COCKLE.

The cow cockle also called Cow-herb and China Cockle is an annual plant which has been introduced into Manitoba from southern Europe. It has spread with rather alarming rapidity throughout the southern portions of the province and has been detected in many other parts of Manitoba and the North-west Territories. The cow cockle grows from seed every year and forms a rather elegant plant from one to two and a-half feet high, much



Cow Cockle.

branched and bearing, in July, a great many pretty pink flowers about half an inch across; these are followed by roundish capsules contained in the five angled enlarged calyces. The seeds are round, hard and black, slightly roughened on the surface, a character by which they can be easily distinguished from the seeds of wild vetches, which are of about the same size.

BLADDER CAMPION.

This well known weed is a deep-rooting perennial which is well established in some parts of the Maritime Provinces and Quebec. It is more often a road-side weed than a crop pest; but in some places it has given a



Bladder Campion.

good deal of trouble to farmers. It is easily recognized by its white flowers and prettily veined bladder-like calyces.

ORANGE HAWKWEED: "PAINT BRUSH."

This pernicious member of the daisy and sunflower family has spread rapidly since its introduction into the Eastern Townships of the Province of Quebec and parts of New Brunswick. It is a vigorous grower throwing out many creeping branches close to the ground, and with its thick foliage crowding out grasses in pastures. It is a shallow-rooted perennial which bears clusters of deep orange (sienna red) or yellow flowers. The seeds

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are furnished with copious down by means of which they are scattered freely by wind. In upland and mountain pastures which cannot be easily ploughed, this plant soon crowds out the grasses and renders the pastures useless. In land used for crops, ploughing and cultivation with hoed crops



Orange Hawkweed: "Paint Brush."

will destroy it. For upland pastures it has been found by Professor L. R. Jones of Vermont, who kindly lent the figure given herewith, that salt broad casted at the rate of $1\frac{1}{2}$ tons to the acre will destroy the weed without any injury to the grass.



Viper's Bugloss.

VIPER'S BUGLOSS.

This weedy, prickly denizen of roadsides and waste places attracts frequent attention with its conspicuous wand of pretty bluish-purple flowers and pink buds. It is a biennial and can be easily destroyed by spudding before the seeds are ripe.

BURS.—HOUND'S TONGUE.

The common bur is well known in every part of Canada. It is seldom seen in crops and is easily destroyed by spudding. The rough barbed seeds are perhaps most injurious by getting tangled the wool of sheep and the hair of dogs.



Burs.

Fig. 1.—A bur
seed coat h

RUSSIAN THISTLE.

So much attention has been drawn to this plant by the Manitoba Department of Agriculture since its discovery in Manitoba, that the farmers of that province should be well informed as to its appearance and characteristics. Although occasional specimens of the Russian Thistle have been found in Ontario, there is little probability of its ever becoming a menace



Fig. 1.

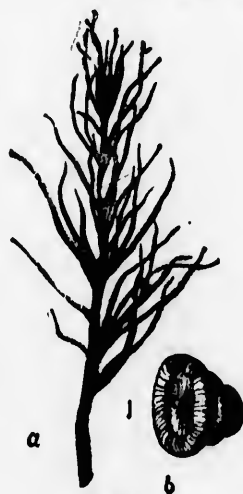


Fig. 2.



Fig. 3.

Russian Thistle.

Fig. 1.—A branch of a mature plant. Fig. 2.—A young stem before flowering, and a single seed enlarged. Fig. 3.—Enlarged prickles, flower and seed from which the seed coat has been removed.

to agriculturists except in a country where the plants can blow long distances in winter. In Manitoba and the North-west Territories the farmers as a rule are now exceedingly wide awake as to the danger of neglecting noxious weeds and it is very unlikely that this weed will be allowed to propagate and spread, now that its dangerous capabilities have been made known.



Curled Dock.

THE CURLED DOCK.

This is perhaps the commonest of all the docks. As a weed in cultivated land this dock is most abundant in the two extremes of the older settled portions of Canada, namely in Nova Scotia and the Niagara district. These tall coarse plants look very unsightly in hay fields and other cultivated land—with a little care and constant attention they are easily eradicated by spudding and pulling.

The excellent figures of Tower Mustard, Pepper Grass, Bladder Campion, Viper's Bugloss, Burs, and Curled Dock, were made specially for this bulletin from photographs taken by Mr. F. T. Shutt.



Ind.



INDIAN HAY OR SWEET GRASS.

One of the most troublesome weeds in Manitoba is Sweet Grass. It is frequently and incorrectly spoken of as Quack or Couch grass, quite a different plant which roots near the surface of the soil and which can be destroyed by ploughing shallow and then cultivating frequently. The Sweet Grass on the other hand roots deeply and shallow ploughing merely encourages it to grow. The treatment which seems to have given the best results in Manitoba, is to plough in spring when the grass is in flower and then seed down heavily at once.

Indian Hay or "Sweet Grass."

LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration. Height.	Time of Flowering	Time of Seeding.
BUTTERCUP FAMILY.					
White Anemone, Pennsylvanian Anemone.	<i>Anemone dichotoma</i> , L., native	Manitoba.	Perennial, 12 in.	June-Aug.	July-Sept.
Long-fruited Anemone.	<i>Anemone cylindrica</i> , Gray, native.	Ont., Que.	Perennial, 2 ft.	June.....	July-Aug.
Tall Buttercup.....	<i>Ranunculus acris</i> , L., Europe.	East.....	Perennial, 2 ft.	June-Aug.	July-Sept.
FUMITORY FAMILY.					
Golden Fumitory ...	<i>Corydalis aurea</i> , Willd., native.	Manitoba.	Biennial, 6-12 in.	June....	June-July
MUSTARD FAMILY.					
Marsh Cress.....	<i>Nasturtium palustre</i> , D. C., native.	E. Canada, Man.	Perennial, 1-3 ft.	June-Sept.	July-Sept.
Powder Mustard.....	<i>Arabis perfoliata</i> , Lam., Europe.	General...	Biennial, 2-4 ft.	June, July	July-Aug.
Hairy Tower Mustard.	<i>Arabis hirsuta</i> , Scop., native.	Manitoba.	Biennial, 1-2 ft.	"	"
Western Wallflower, Prairie Rocket.	<i>Erysimum asperum</i> , D. C., native.	" ..	Biennial, 6-12 in.	"	"
Small-flowered Wallflower.	<i>Erysimum parviflorum</i> , Nutt., native.	" ..	Biennial, or perennial, 12-18 in.	"	"
Wormseed Mustard.	<i>Erysimum cheiranthoides</i> , L., native.	General...	Annual and biennial, 12 in.	"	"
*Hare's-ear Mustard	<i>Conringia orientalis</i> (L.), Andr., Europe.	Manitoba.	Annual, 1-2½ ft.	"	"
Out-leaved Tansy Mustard.	<i>Sisymbrium incisum</i> , Engelm., native.	" ..	Annual and biennial, 1-4 ft.	June.....	July.....
Crowded Tansy Mustard.	<i>Sisymbrium incisum</i> , var., <i>Hartwegianum</i> , Watson, native.	"	Biennial, 1-4 ft.	"	"
Tansy Mustard.....	<i>Sisymbrium canescens</i> , Nutt., native.	Man., Ont.	Annual, 12 in.	"	"
*Tumbling Mustard.	<i>Sisymbrium irio</i> , L., (= <i>S. nigrum</i> , Crantz), Europe.	N. W. T., Man.	Annual and winter annual, 1-4 ft.	June, July	July-Aug.
*Wild Mustard, Charlock, Cadluck, Her-rick.	<i>Brassica campestris</i> , L., Europe.	General...	Annual, 1-3 ft.	June-Sept.	July-Sept.
*Bird Rape.....	<i>Brassica campestris</i> , L., Europe.	Manitoba.	Annual, 1-3 ft.	"	"
*False Flax, Gold of Pleasure.	<i>Camelina sativa</i> , Crantz, Europe.	Manitoba, N. W. T., Ont.	Annual and winter annual, 1-2 ft.	June, July	"

Weeds, with their chief characters.

Time of Seeding.	Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of Propagation and Distribution.	Place of Growth, and Products Injured.	Methods of Eradication.
uly-Sept.	White, 1-1½ in., solitary; head of fruit round.	Seeds and root-stocks.	Low meadows; hay	Plough up sod and follow with hoed crop.
uly-Aug.	Greenish white, ½-in., 2-6 flowers; head of fruit cylindrical, 1-in. long.	Seeds, wind...	Upland meadows, pastures.	"
uly-Sept.	Yellow, ¾-in., solitary	Seeds, in hay.	Meadows; hay and pasture.	"
ane-July	Yellow, ½-in., raceme	Seeds.	Wheat fields	Summer fallow; cultivate fall and spring.
ly-Sept.	Yellow; raceme, 1-3-in.	Seeds, in hay.	Lowlands; grain fields and hay.	Plough fall and spring.
ly-Aug.	Yellowish-white; racemes slender, elongated; pods erect, narrow, smooth, close to stem, only root leaves rough.	Seeds.	Grain and clover fields.	Plough fall and spring, hand-pull before seeds ripen
"	White; very similar to above, but smaller and stems hairy.	"	Grain fields and summer-fallows.	"
"	Yellow, nearly 1-in.; racemes elongating in fruit; pods angled, 5-in. long, spreading.	"	Summer-fallows...	"
"	Yellow, ½-in.; racemes elongated; differing from above in the small flowers, short pods, 1-2½-in. long, ascending and close to stem, covered with short gray hairs.	"	"	"
"	Yellow, ½-in.; racemes elongated; pods small, less than 1-in. on slender spreading stalks.	"	Grain fields, summer fallows, waste places.	"
"	Creamy white, ½-in., racemes elongated; pods 4-in., square, ascending; leaves quite smooth, entire, succulent, glaucous.	"	Grain fields	Hand-pull, summer fallow, hoed crops.
"	Yellow, ½-in.; racemes elongated; pods smooth, spreading, curved, ½-in.; seeds, 1-ranked; leaves thin, green, almost without hairs.	"	Grain fields and summer fallows.	"
"	As above, but pods short about ½-in., ascending, close to stem, forming a crowded raceme; seeds, 1 or 2-ranked.	"	Grain fields and summer fallows. Often seen on sod roofs in the west.	"
"	Resembling No. 13, but smaller, generally more branching and grayer in colour; leaves finely cut up; pods, ½-¾-in. on stalks of equal length, ascending, seeds, 2-ranked.	"	do	"
Aug.	Yellow, pale, ½-in., racemes elongated; pods, 2-4-in., very slender, spreading, seeds greenish brown.	Seeds, wind...	Grain fields	"
Sept.	Yellow, ½-in., racemes; pods erect, 1-1½-in., one-third being an empty or 1-seeded, two-edged beak; stems, bristly-hairy, purple at joints.	Seeds, in grain	"	"
"	Yellow, bright, ½-in. racemes; pods, 1½-2½-in., spreading; stems perfectly smooth, glaucous.	"	"	"
"	Yellow, ½-in., racemes; pods, pear-shaped, many seeded.	Seeds, in grain, flax & clover seed.	Grain, fall wheat, flax and clover fields.	"
"				Sow spring grain.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration. Height.	Time of Flowering	Time of Seeding.
MUSTARD FAMILY.					
*Ball Mustard.....	<i>Nastia paniculata</i> (L.), Desv., Europe.	Manitoba.	Annual and winter annual, 1-2 ft.	June, July	July-Sept.
*Shepherd's Purse...	<i>Capsella Bursa-pastoris</i> , Medic., Europe.	General...	" ..	May-Oct.	June-Oct.
*Stink-weed, Penny Cress, "French Weed."	<i>Thlaspi arvense</i> , L., Europe.	General; most abundant in Man.	" ..	" ..	" ..
*Peppergrass	<i>Lepidium apetalum</i> , Willd. (= <i>L. intermedium</i> , Gray), native.	General; most injurious in the west.	" ..	" ..	" ..
CAPER FAMILY.					
Spider Flower.....	<i>Cleome integrifolia</i> , L., native.	Manitoba.	Annual, 1-3 ft.	July-Aug.	August..
ST. JOHN'S-WORT FAMILY.					
Common St. John's-wort.	<i>Hypericum perforatum</i> , L., Europe.	General...	Perennial, 1-2 ft.	June-Sept	June-Sept
PINK FAMILY.					
*Cow Cackle.....	<i>Saponaria Vaccaria</i> , L., Europe.	Manitoba.	Annual, 2 ft.	July-Aug.	Aug.-Sept
Sleepy Catchfly.....	<i>Silene antirrhina</i> , L., native.	" ..	Annual, 1-2 ft.	June-Sept	July-Sept.
Night-flowering Catchfly, Sticky Cackle.	<i>Silene noctiflora</i> , L., Europe.	General ..	Annual and winter annual, 1-2 ft.	July-Aug.	Aug.-Sept
*Cockle, Corn Cockle	<i>Lychnis Githago</i> , Lam., Europe.	" ..	Annual, 1-2 ft.	July-Sept	Sept.....
*Chickweed.....	<i>Stellaria media</i> , Smith, Europe.	" ..	Annual and winter annual, prostrate.	April-Nov	Apr.-Nov.
Bladder Campion....	<i>Silene Cucubalus</i> , Wibel (= <i>S. inflata</i> , Smith), Europe.	" ..	Perennial, 1-2 ft.	June-Aug	July-Sept.
PURSLANE FAMILY.					
*Purslane, Pusley...	<i>Portulaca oleracea</i> , L., Europe.	" ..	Annual, prostrate.	July till frost.	Aug. till frost.
MALLOW FAMILY.					
Common Mallow.	<i>Malva rotundifolia</i> , L., Europe.	" ..	Biennial, prostrate.	June-Oct.	July-Oct..
Mouse-ear Chickweed	<i>Cerastium vulgatum</i> , L., Europe.	" ..	Perennial, prostrate.	May-July.	July-Aug.
Field Chickweed....	<i>Cerastium arvense</i> , L., native.	Manitoba, Quebec, Maritime Provinces	Perennial, 6 in.	" ..	" ..
Corn Spurry.....	<i>Spergula arvensis</i> , L., Europe.	General ..	Annual, 6-12 in.	June-July	July-Sept.
Ladder Ketmia, Flower of an hour.	<i>Hibiscus trionum</i> , L., Europe.	Western Ontario.	Annual, 1-2 ft.	July-Aug.	Aug.-Sept

Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of Propagation and Distribution.	Place of Growth and Products Injured.	Methods of Eradication.
Orange yellow, $\frac{1}{2}$ -in., racemes, much elongated in fruit; pods nearly spherical, 1-seeded.	Seeds, in grain	Grain fields. . . .	Pull, summer fallow, hoed crops.
White, $\frac{1}{2}$ -in., racemes, much elongated in fruit; pods triangular.	Seeds.	Everywhere.	Constant hoeing and cultivation.
White, $\frac{1}{2}$ -in. racemes, much elongated in fruit; pods flat and round, over $\frac{1}{2}$ -in.	"	Grain fields, waste places.	Mow and burn mature plants, thorough cultivation.
Whitish, minute, $\frac{1}{2}$ -in., racemes, much elongated in fruit; pods flat, roundish. $\frac{3}{4}$ -in. 2-seeded.	"	Grain fields, after a wet spring.	Plough or cultivate fall and spring.
Reddish purple, 1-in., petals 4, stamens 6, long and conspicuous; racemes; pod flattened, hanging, $1\frac{1}{2}$ -in.; leaves 3-parted, strong smelling.	Seeds, carried by floods.	Grain fields and low spots.	Pull, cultivate.
Yellow, $\frac{1}{2}$ -in., cymes.	Seeds, carried in hay, root stocks.	Pastures and fields	Break up sod, cultivate.
Pink, $\frac{1}{2}$ -in., cymes; calyx 5-angled, covering ripe pods; leaves succulent and glaucous; seeds $\frac{1}{16}$ -in. black, minutely roughened.	Seeds in grain.	Grain fields. . . .	Pull, cultivate.
Pink, very small; stem slender, erect, each joint bearing a glutinous patch.	Seeds.	Grain fields, summer fallows.	Summer fallow.
Pink, yellow outside, 1-in., solitary; opening at night; whole plant viscid, hairy; calyx tubular 10-ribbed.	"	Fields, gardens . . .	Pull, cultivate.
Purple, 1-in., solitary; seeds $\frac{1}{2}$ -in., black, rough.	Seeds in grain.	Grain fields, summer fallows.	Pull, sow clean grain.
White, $\frac{3}{4}$ -in.; each internode with a line of white hairs.	Seeds, in seed and manure, birds.	Gardens, lawns, low ground.	Cultivate early and thoroughly.
White, $\frac{1}{2}$ -in., hanging; loose panicle calyx inflated, veined; leaves glaucous.	Seeds, root stocks.	Fields and roadsides.	Summer fallow, cultivate.
Yellow, $\frac{1}{2}$ -in., solitary; stems red, leaves wedge-shaped; whole plant fleshy.	Seeds.	Gardens and fields	Cultivate early.
Pinkish, $\frac{1}{2}$ -in., solitary.	"	Roadsides and fields.	Hoe, cultivate.
White, $\frac{1}{2}$ -in., clusters terminal.	"	Gardens and fields	Cultivate.
White, $\frac{1}{2}$ -in.; clusters terminal, leaves linear; stems ascending.	"	Fields, summer fallows.	Summer fallow, cultivate.
White, $\frac{1}{2}$ -in.; panicle; leaves thread-like in whorls.	"	Grain fields, sandy land.	Cultivate, constantly.
Yellow with black eye, 1-in., open from 10 to 12 a.m., solitary; stems erect, lower branches decumbent.	"	Gardens	Pull, cultivate.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration. Height.	Time of Flowering	Time of Seeding.
GERANIUM FAMILY.					
Heron's-bill, Stork's-bill, Alfilaria, Pin-grass.	<i>Erodium cicutarium</i> , L'Her., Europe.	Que., B.C.	Annual, 3-12 in., prostrate.	All the year.	Summer..
PEA FAMILY.					
Wild Vetch, Wild Tare.	<i>Vicia sativa</i> , L., Europe.	General ..	Annual, 1-2 ft.	July-Aug.	Aug.-Sept
Purple Tufted-Vetch	<i>Vicia cracca</i> , L., Europe.	Eastern Canada.	Perennial, 1-3 ft.	" ..	" ..
Wild Liquorice	<i>Glycyrrhiza lepidota</i> , Nutt, native.	Manitoba, N.W.T.	Perennial, 2-3 ft.	July.....	" ..
ROSE FAMILY.					
Hard-hack, Steeple bush.	<i>Spiraea tomentosa</i> , L., native..	Que.....	Perennial, 1-4 ft.	July.....	Aug.....
Erect Cinquefoil....	<i>Potentilla Norvegica</i> , L., native.	General ..	Annual, winter annual, 6-24 in.	June-July	July-Aug.
Silvery "	<i>Potentilla argentea</i> , L., Europe.	Eastern Canada.	Perennial, 6 in.	June-Sept	July-Sept.
Silverweed, Cinquefoil.	<i>Potentilla anserina</i> , L., native.	General...	Perennial, 6 in.	" ..	" ..
Prairie Rose.....	<i>Rosa Arkansana</i> , Porter, native.	Manitoba, N.W.T.	Shrub, 3 in.-3 ft.	June-July	Aug.-Sept
STONECROP FAMILY.					
Live-forever	<i>Sedum Telephium</i> , L., Europe.	Ont., Que.	Perennial, 1-2 ft	July.....	Sept.....
EVENING PRIMROSE FAMILY.					
Glandular Willow-herb.	<i>Epilobium adenocaulon</i> , Haussk., native.	General ..	Biennial, 1-3 ft.	July Aug.	Aug.-Sept
Common Evening Primrose.	<i>Oenothera biennis</i> , L., native.	" ..	Biennial, 1-4 ft.	July.....	July-Sept.
* White Evening Primrose.	<i>Oenothera albicaulis</i> , Nutt, native.	Manitoba, N.W.T.	Perennial, 6 in.-4 ft.	"	Aug.-Sept
PARSLEY FAMILY.					
Carrot	<i>Daucus Carota</i> , L., Europe.	Ont., Que., Maritime Provinces	Biennial, 1-2 ft.	July-Aug.	Aug.-Sept
Caraway.....	<i>Carum carui</i> , L., Europe	General .	Biennial, 1-2 ft.	July.....	" ..
Spotted Cowbane, Musquash Root, Beaver Poison.	<i>Cicuta maculata</i> , L., native.	" ..	Perennial, 2-6 ft.	July-Aug.	Sept.....

Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of Propagation and Distribution.	Place of Growth, and Products Injured.	Methods of Eradication.
Purple, $\frac{1}{2}$ -in., umbel; leaves feathery pinnatifid; styles in fruit elongated, twisting spirally when ripe, bearded inside.	Seeds.....	Gardens, fields....	Hoe, cultivate....
Purple, $\frac{1}{2}$ -in., solitary; ripe pods black; seeds round, $\frac{1}{2}$ -in., mottled or velvety black.	Seeds, in grain	Fields.. ..	Summer fallow, hoed crop.
Violet and blue, $\frac{1}{2}$ -in., spikes long crowded 1-sided, about 30 flowers; pods, light brown; seeds round, $\frac{1}{2}$ -in., dark brown, mottled.	" in hay..	Hay fields, fields..	Plough, hoed crop.
Whitish, $\frac{1}{2}$ -in., spikes peduncled; pods oblong, $\frac{1}{2}$ -in., covered with hooked prickles.	Seeds, pods attached to stock, in hay	Summer fallows, pastures; wool.	Summer fallow early.
Rose coloured, small, in dense terminal panicles; leaves below brownish and woolly.	Seeds	Mountain pastures	Pull and grub out.
Yellow, $\frac{1}{2}$ -in., leafy cymes; leaves 8-parted; whole plant dark green, hairy.	"	Summer fallows, grain fields.	Summer fallow, cultivate.
Yellow, $\frac{1}{2}$ -in., stems spreading, ascending, paniculate, many flowered; leaves dark green above, silvery white beneath.	"	Pastures, lawns, hay fields.	Breaksod, cultivate
Bright yellow, $\frac{1}{2}$ -in., solitary on long stalks.	" runners.	Low lands, particularly if alkaline.	Summer fallow, cultivate.
Pink to deep rose, $2\frac{1}{2}$ -in., corymb...	" rootstocks.	Summer fallows, grain fields.	Summer fallow early, harrow, cultivate.
Purple, in close compound cymes, 2-3-in. across; whole plant fleshy.	Seeds, portions of stem or root.	Pastures, hay....	Spud, break sod, cultivate.
Purplish, $\frac{1}{2}$ -in., panicle erect; leaf stalks very short; stem glandular pubescent.	Seeds, wind...	Low land, summer fallows, grain on stubble.	Plough fall or spring, summer fallow early.
Yellow, $1\frac{1}{2}$ -in., open at night, leafy spike.	"	Summer fallows...	Pull, plough fall and spring.
White, turning pink, 2-in., malodorous leafy spikes; buds nodding; stems glistening white, simple, branched at the top.	Seeds and rootstocks.	Grain fields on knolls.	Summer fallow, cultivate thoroughly.
White, in umbel, central flower red; umbel 3-in. across, closing in like a bird's nest when mature; seed bristly.	Seeds, carried by animals.	Fields, pastures, road sides.	Break sod, spud.
White; umbel 2-in. across; seeds oblong, ribbed, smooth, aromatic.	Seeds	Road sides, pastures.	Spud, mow in flower
White; umbel 4-in. across; stem stout, spotted with purple, strong smelling, very poisonous.	Seeds, carried by floods.	Wet meadows, troublesome in hay, poisonous to stock,	"

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration. Height.	Time of Flowering	Time of Seeding.
HONEYSUCKLE FAMILY.					
Wolfberry, Western Snow-berry.	<i>Symphoricarpos occidentalis</i> , Hook., native.	Manitoba, N.W.T.	Shrub, 2-3 ft.	July.....	Sept.....
BEDSTRAW FAMILY.					
Northern Bedstraw.	<i>Galium boreale</i> , L., native	"	Perennial, 1-2 ft.	July.....	Aug.....
SUNFLOWER FAMILY.					
Gumweed.....	<i>Grindelia squarrosa</i> , Dunal, native.	"	Biennial, 12-18 in.	July-Aug.	Aug.-Sept
Goldenrod.....	<i>Solidago Canadensis</i> , L., native.	General..	Perennial, 2-3 ft.	July.....	" ..
Narrow-leaved Goldenrod.	<i>Solidago lanceolata</i> , L., native.	"	Perennial, 12-18 in.	"	Aug.....
Many-flowered Starwort.	<i>Aster multiflorus</i> , Ait., native.	Manitoba, N.W.T.	Perennial, 12-18 in.	"	"
Canada Fleabane, Horse-weed "Fireweed."	<i>Erigeron Canadensis</i> , L., native.	General..	Annual and winter annual, 6 in.-5 ft.	July-Oct..	Aug.-Oct.
Daisy Fleabane.....	<i>Erigeron annuus</i> , Pers., native.	"	Annual and winter annual, 3 in.-5 ft.	June-Aug	July-Aug.
Rough Daisy Fleabane.	<i>Erigeron trigonatus</i> , Muhl. native.	"	Annual and winter annual, 1-2 ft.	" ..	" ..
Rosy Fleabane.....	<i>Erigeron Philadelphicus</i> , L., native.	"	Annual and winter annual, 1-2 ft.	" ..	" ..
Plantain-leaved Everlasting.	<i>Antennaria plantaginifolia</i> , Hook., native.	"	Perennial, prostrate.	May.....	June.....
Pearly Everlasting..	<i>Anaphalis margaritacea</i> , Benth. and Hook., Asia	"	Perennial, 1-2 ft.	July.....	Aug.....
Scented Everlasting.	<i>Gnaphalium polycephalum</i> , Michx., native.	Eastern Canada.	Annual, 1-2 ft.	June-July	"
Low Cudweed.....	<i>Gnaphalium uliginosum</i> , L., native.	General..	Annual, 4-8 in.	July.....	Aug.-Sept
Poverty Weed.....	<i>Iva axillaris</i> , Pursh., native.	Manitoba, N.W.T.	Perennial, 6-12 in.	July-Aug.	" ..
False ragweed, Turkey-foot, marsh elder.	<i>Iva xanthiifolia</i> , Nutt., native.	Man.....	Annual, 1-4 ft.	Aug-Sept.	Sept-Oct.
*Great ragweed, crownweed, riverweed.	<i>Ambrosia trifida</i> , L., native.	"	" ..	July-Sept	Aug-Nov.
Ragweed, Roman wormwood, richweed.	<i>Ambrosia artemisiifolia</i> , L., native.	General..	" .. 1-3 ft.	" ..	" ..

Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of Propagation and Distribution.	Place of Growth, and Products Injured.	Methods of Eradication.
Red, much bearded inside, $\frac{1}{2}$ -in., dense terminal and axillary spikes; berry reddish, $\frac{1}{2}$ -in.	Seeds and running root-stocks.	Newly broken land, summer fallows and pastures.	Break early, summer fallow.
White, small, in large terminal panicles.	" ..	Grain fields, pastures.	Summer fallow, cultivate.
Bright yellow; $\frac{3}{4}$ -in.; whole plant glutinous; bud bearing large drop of white resin.	Seeds, wind, in hay.	Fields, pastures, road sides.	Mow, cultivate.
Yellow, head large, 1-sided.....	Seeds, running root-stocks, wind.	Grain fields, summer fallows.	Plough and cultivate.
Bright yellow; dense corymbs; leaves narrow.	" ..	Low land, fields and pastures.	"
White; $\frac{1}{2}$ -in., crowded on spreading branches.	" ..	Grain fields, sandy land.	"
White; heads very numerous, small, crowded in a slender erect wand-like panicle.	Seeds, wind...	Summer fallows, grain fields.	Summer fallow early, cultivate fall and spring.
White, tinged with purple, $\frac{1}{2}$ -in.; corymb; leaves coarsely toothed.	Seeds, wind, in hay.	Grain fields, gardens.	Cultivate fall and spring.
White; $\frac{1}{2}$ -in., panicle corymb; leaves entire or nearly so, rough.	" ..	" ..	"
Rose pink; $\frac{3}{4}$ -in., showy, corymb; leaves clasping.	" ..	Low lands, fields, pastures, gardens.	"
White, $\frac{1}{2}$ -in., a small crowded cluster; flowering stem erect, naked.	Seeds, offsets and runners.	Pastures.....	Break up sod, cultivate.
White, $\frac{1}{2}$ -in., many in a terminal corymb; stem leafy, white, downy.	Seeds, running root-stocks, wind.	Meadows and pastures.	"
Yellowish white, $\frac{1}{2}$ -in., terminal clusters; stem leafy; whole plant, fragrant.	Seeds, wind...	" ..	"
Inconspicuous; terminal leafy clusters.	Seeds, floods...	Low ground, fields, meadows and pastures.	Drain thoroughly.
Inconspicuous; $\frac{1}{2}$ -in., hanging, short-stalked in axils of the upper leaves; leaves less than 1-in., rough, oblong linear, entire, opposite below, alternate above.	Copious underground creeping stems.	Grain fields.....	Summer fallow, cultivate constantly.
Green, $\frac{1}{2}$ in., crowded in large terminal panicles; stem smooth.	Seeds, wind, floods.	Grain crops, road-sides.	Pull, mow.
Yellow, $\frac{1}{2}$ in., sterile flowers in terminal racemes or spikes, fertile flowers axillary at base of spikes; stems rough; seed $\frac{1}{2}$ in., bearing a crown of 5-6 tubercles above the middle; leaves 3-lobed.	Seeds, in grain, wind, floods.	Low rich land, grain fields, wheat.	Pull, mow, burn old plants.
Yellow, $\frac{1}{2}$ in., sterile in racemes, fertile green, axillary; seed $\frac{1}{2}$ in. long, with 6 short sharp spines; leaves finely cut up.	" ..	Rich cultivated land, all crops.	Cultivate late, mow stubbles.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration. Height.	Time of Flowering	Time of Seeding.
Perennial ragweed..	<i>Ambrosia psilostachya</i> , D. C., native.	Manitoba, N.W.T.	Perennial, 1-2 ft.	July-Sept.	Aug-Nov.
Cocklebur	<i>Xanthium strumarium</i> , L., Europe.	General ..	Annual, 1-2 ft.	June-Sept	Aug-Sept.
Blackeyed Susan, orange daisy, cone-flower, niggerhead.	<i>Rudbeckia hirta</i> , L., native.	" ..	Biennial, 1-2 ft.	June- Aug	" ..
Wild sunflower.....	<i>Helianthus rigidus</i> , Desf., native.	Manitoba, N.W.T.	Perennial, 1-3 ft.	July- Aug	" ..
"	<i>H. Maximiliani</i> , Schrad., native.	Manitoba, N.W.T.	Perennial, 1-4 ft.	" ..	" ..
"	<i>H. Nuttallii</i> , T. & G., native.	Manitoba, N.W.T.	" ..	" ..	" ..
Common beggar-ticks, pitch-forks.	<i>Bidens frondosa</i> , L., native.	General ..	Annual, 1-3 ft.	" ..	" ..
Sneezeweed	<i>Helenium autumnale</i> , L., native.	Manitoba, N.W.T., B.C.	Perennial, 1-3 ft.	Aug Sept	Sept- Oct.
Mayweed, dogfennel, stinking chamomile.	<i>Anthemis Cotula</i> , L., Europe.	General ..	Annual, 1 ft.	June- Aug	July- Sept
Yarrow, milfoil.....	<i>Achillea Millefolium</i> , L., Europe.	" ..	Perennial, 6-18 in.	July- Aug	Aug-Sept.
*Ox-eye daisy, white-weed.	<i>Chrysanthemum Leucanthemum</i> , L., Europe.	Eastern Canada.	Perennial, 18-24 in.	June- Aug	June-Sept
Pasture sage, western mugwort.	<i>Artemisia Ludoviciana</i> , Nutt., native.	Prairie Provinces.	Perennial, 1-2 ft.	July- Aug	Aug-Sept.
Sweet sage.....	<i>Artemisia frigida</i> , Willd., native.	Prairie Provinces.	Perennial, 12-18 in.	" ..	" ..
False Tansy, biennial worm-wood, carrot-top.	<i>Artemisia biennis</i> , Willd., native.	General ; Prairie Provinces	Biennial and annual, 1-5 ft.	" ..	" ..
Fireweed.....	<i>Erechtites hieracifolia</i> , Raf., native.	General ..	Annual, 1-3 ft.	July- Sept	July-Sept
Burdock.....	<i>Arctium Lappa</i> , L., Europe.	" ..	Biennial, 3-4 ft.	" ..	Aug-Oct .
Common groundsel..	<i>Senecio vulgaris</i> , L., Europe.	Quebec, Maritime Provinces	Annual, 6-12 in.	" ..	July- Sept
*Sinking Billy, baugh-lan, common ragwort.	<i>Senecio Jacobæa</i> , L., Europe.	Maritime Provinces	Perennial, 2 ft.	" ..	Aug- Sept
Knautweed, hard-heads.	<i>Centaurea nigra</i> , L., Europe.	" ..	" ..	Aug-Sept.	" ..

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Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers, and other Characters of the Plant.	Method of propagation and Distribution.	Place of Growth and Products Injured.	Methods of Eradication.
Yellow, $\frac{1}{2}$ in., sterile in racemes, fertile green, axillary; seed $\frac{1}{2}$ in long, hairy without spines. Plant grayish-green.	Seeds, running root-stocks.	Rich cultivated land, all crops.	Summer fallow early, cultivate deep.
Green, $\frac{1}{2}$ in. in heads; leaves triangular, toothed, rough; seed in a 2-celled prickly bur, $\frac{1}{2}$ in. long with 2 hooked spines at tip.	Seeds. Burs carried by animals.	Low fields, wool...	Mow, burn old plants, cultivate.
Orange and purple, 2 in., whole plant very rough.	Seeds, in hay and clover seed.	Meadows, grain fields.	Mow often, spud, summer fallow.
Dark yellow rays, disk black 2 in.; heads few, on long purplish stalks.	Seeds, running root-stocks.	New breaking, grain fields.	Summer fallow early, cultivate.
Pale yellow rays, disk yellow; heads numerous 3 in., on short leafy stalks up the stem; leaves grayish.	" " "	" " "	" "
Golden yellow, 4 in.; heads few, sweet scented; leaves green.	" " "	" " "	" "
Yellow, $\frac{1}{2}$ in., heads; seeds flat, 2-awned, wedge-shaped; leaves 3-5 divided.	Seeds, carried by animals, floods.	Low land, grain fields.	Drain, cultivate.
Yellow, rays 3-5 cleft drooping; disk globular; heads 1 in., in terminal corymbs; leaves decurrent on the stems.	Seeds, rootstocks.	Low spots in fields, hay.	Drain, spud, break up sod, cultivate.
White, $\frac{1}{2}$ in., heads.....	Seeds, in hay and grass seed.	Meadows, road-sides, grain fields.	Mow, seed down, hoe-crop.
White, $\frac{1}{2}$ in., in flat heads, 2 inches across; leaves very feathery.	Seeds, offsets.....	Meadows, pastures.	Break up sod, cultivate.
White, 1 in., Ls 2's... ..	Seeds, offsets, in grass and clover seed.	Meadows, pastures, cultivated fields.	Break up sod, seed to clover, cultivate.
Silvery white, like the whole plant; heads small, numerous in short spikes forming an elongated panicle; bitter, strongly scented.	Seeds, running root-stocks.	Pastures, summer fallows, hay.	Break up sod, summer fallow.
As above, but flowers in racemes.	" " "	" " "	" "
Whole plant dark green, the numerous very small flowers in a tall wand-like, leafy panicle.	Seeds, floods.....	Grain fields, particularly on stubble, hay, market value of land.	Plough fall and spring, summer-fallow.
Yellowish; elongated panicle.	Seeds, wind.....	Fields, low lands, all crops.	Cultivate, pull, hoe.
Purple, $\frac{1}{2}$ in. clustered; leaves very large like rhubarb.	Seeds, carried by animals.	Pastures, road sides, rich land, wool, grain.	Spud, mow, burn.
Yellow, corymb.....	Seeds, wind.....	Gardens, fields, all crops.	Hoe, cultivate frequently.
Yellow, $\frac{1}{2}$ in., in flat cymes..	Seeds, offsets, wind.	Pastures, road sides, &c.	Break up sod, spud, mow to prevent seeding.
Purple; globular, black outside; stems rough and tough.	Seeds.....	" " "	Break up sod, spud.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious,	Duration	Time of Flowering	Time of Seeding.
*Canada thistle.....	<i>Cnicus arvensis</i> , Hoffm., Europe.	General ..	Perennial, 3 ft.	June-Aug	July-Sept
Bull-thistle!.....	<i>Cnicus lanceolatus</i> , Hoffm., Europe.	" ..	Biennial, 3 ft.	July-Aug	July-Aug
Western bullthistle, prairie thistle.	<i>Cnicus undulatus</i> , Gray, native.	Prairie Provinces	Perennial, 2 ft.	" ..	" ..
Chicory.....	<i>Cichorium Intybus</i> , L., Europe.	General ..	Perennial, 2-3 ft.	July-Oct.	Aug-Oct.
Fall dandelion, hawk bit.	<i>Leontodon autumnalis</i> , L., Europe.	Mar. Prov.	Perennial, 6-12 in.	June-Oct.	June-Oct.
Dandelion.....	<i>Taraxacum officinale</i> , Weber, Europe.	General ..	Perennial, 2-12 in.	Summer..	Summer..
*Orange hawkweed, paint brush.	<i>Hieracium aurantiacum</i> , L., Europe.	Quebec ..	Perennial, 6-12 in.	June-Aug	June-Sept
Skeleton weed.....	<i>Lygodesmia juncea</i> , Don., native.	Prairie Provinces.	Perennial, 12 in.	July-Aug	July-Aug
*Prickly lettuce.....	<i>Lactuca Scariola</i> , L., Europe.	B.C., Ont.	Annual, 3-6 ft.	" ..	July-Sept
*Blue lettuce, showy lettuce.	<i>Lactuca pulchella</i> , DC., native.	Prairie Provinces.	Perennial, 1-2½ ft.	" ..	" ..
*Perennial sow-thistle, field sow-thistle.	<i>Sonchus arvensis</i> , L., Europe.	Eastern Canada.	Perennial, 3-4 ft.	July-Sept	July-Oct.
Sowthistle, milk thistle.	<i>Sonchus oleraceus</i> , L., Europe.	General ..	Annual, 1-2 ft.	Summer..	Summer..
Spiny sowthistle.....	<i>Sonchus asper</i> , Vill., Europe.	" ..	" ..	" ..	" ..
LOBELIA FAMILY.					
Indian tobacco.....	<i>Lobelia inflata</i> , L., native.	Eastern Canada.	Annual, 1 ft.	July-Nov.	Aug.-Nov
PRIMROSE FAMILY.					
Sea milkwort.....	<i>Glauz maritima</i> , L., native.	Prairie Provinces	Perennial, 6 in.	June.....	July.....
DOGBANE FAMILY.					
Spreading dogbane..	<i>Apocynum androsaemifolium</i> , L., native.	General ..	Perennial, 1-2 ft.	July.....	Sept.....
Indian hemp.....	<i>Apocynum cannabinum</i> , L., native.	" ..	Perennial, 2-3 ft.	July-Aug.	" ..
MILKWEED FAMILY.					
Common milkweed, silkweed, wild cotton.	<i>Asclepias Cornuti</i> , De Caisne, native.	Eastern Canada.	" ..	June-Aug	July-Oct.
BORAGE FAMILY.					
Viper's bugloss, blue-weed.	<i>Echium vulgare</i> , L., Europe.	" ..	Biennial, 6-18 in.	July-Oct.	Aug.-Oct.

Weeds, with their chief characters—Continued.

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of Propagation and Distribution.	Place of Growth and Products Injured.	Methods of Eradication.
Lilac; $\frac{2}{3}$ in.; running rootstocks.	Seeds, wind.	Fields, grain, pastures, all crops.	Mow in July and September and cultivate frequently.
Purple; 2 in.	"	Fields, meadows, grain, hay.	Spud, cultivate, mow.
Lilac purple, 2 in.; whole plant grayish.	"	Roadsides, summer fallows.	Summer-fallow.
Bright blue; $1\frac{1}{2}$ in.; almost leafless stems.	Seeds, floods.	Fields, roadsides. .	Plough, cultivate.
Yellow; $\frac{3}{4}$ in.; down of seeds tawny.	Seeds, wind.	Gardens, pastures, roadsides.	Break up sod, hoe.
Yellow; $1\frac{1}{2}$ in.	"	Pastures, lawns, gardens.	Spud.
Orange red or yellow; $\frac{1}{2}$ in.; terminal clusters; running rootstocks.	Seeds, running rootstocks, in clover seed, and hay, wind.	Mountain pastures, meadows, fields.	Salt broad casted $1\frac{1}{2}$ tons to the acre or grass land, cultivate.
Pink; $\frac{1}{2}$ in., solitary; exuding milky juice when cut, stems much branched, almost leafless.	Seeds, running rootstocks.	Grain fields.	Summer-fallow, cultivate.
Yellow; $\frac{1}{2}$ in.; panicle. . . .	Seeds, wind.	Fields, all crops. .	Cultivate, hoe, mow and burn.
Blue; $\frac{3}{4}$ in., few; loose panicle; glaucous.	Seeds, deep running rootstocks.	Grain fields, especially on slightly alkaline lands.	Plough deep, cultivate.
Yellow; $1\frac{1}{2}$ in., 3 or 4 at the top of a leafless stem; foot stalks covered with soft glandular hairs; running rootstocks.	Seeds, wind, running rootstocks.	Fields, all crops. .	Pull when in bloom, plough, hoe crop.
Pale yellow; $\frac{1}{2}$ in.; corymb; leaves heart-shaped at base, with many soft spines and two sharp auricles.	Seeds, wind.	Gardens, all crops in rich land.	Hoe, pull.
Pale yellow; $\frac{1}{2}$ in. corymb; leaves less divided, more prickly the auricles at the base rounded.	"	" " " " " "	" "
Blue, $\frac{1}{2}$ in., racemes; pods inflated.	Seeds, in hay and grass seeds.	Meadows, pastures, grain fields; poisonous.	Pull, cultivate, hoe.
Pink, $\frac{1}{2}$ in.	Seeds, rootstocks. .	Meadows, wet fields on alkaline lands.	Summer fallow, cultivate.
Pink, $\frac{1}{2}$ in., bell-shaped, hanging, cyme; seed pods $\frac{3}{4}$ in. long, in pairs; stems red, juice milky.	Seeds, running rootstocks, wind.	Fields, summer fallows.	" "
White, $\frac{1}{2}$ in., erect; cyme; juice milky.	" " ..	Fields, moist grounds.	" "
Pinkish, $\frac{1}{2}$ in., umbels.	Seeds, running rootstocks, wind.	Rich soil, all crops.	Mow while in bloom, plough, hoed crops.
Blue, $\frac{1}{2}$ in., buds red; raceme of short lateral clusters; stem and leaves rough, bristly.	Seeds.	Roadsides, fields. .	Spud, cultivate.

A list of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration.	Time of Flowering	Time of Seeding.
CONVOLVULUS—Con.					
Small bugloss.....	<i>Lycopsis arvensis</i> , L., Europe.	Maritime Provinces	Annual, 6-12 in.	July-Oct.	Aug.-Oct.
Cornigromwell, wheat thief, pigeon-weed.	<i>Lithospermum arvensc.</i> , L., Europe.	Eastern Canada.	"	June-Aug	July-Sept
Blue bur, stick-seed.	<i>Echinospermum Lappula</i> , Lehm., Europe.	General ..	Annual and winter ann. 1 ft.	"	"
Burs, Common hound's-tongue.	<i>Cynodassum officinale</i> , L., Europe.	"	Biennial, 1-2 ft.	"	"
CONVOLVULUS FAMILY.					
*Bindweed	<i>Convolvulus arvensis</i> , L., Europe.	"	Perennial, climber.	June-Sept	Aug.-Nov
Morning-glory, bracted bind-weed.	<i>Convolvulus sepium</i> , R. Br., native.	Man.	"	"	Aug.-Sept
Clover dodder, devil's gut.	<i>Cuscuta epithymum</i> , Murr., Europe.	"	Annual, climber.	June-Nov	July-Nov.
NIGHTSHADE FAMILY					
Common nightshade.	<i>Solanum nigrum</i> , L., Europe.	"	Annual, 6 in.	June-Sept	July-Oct.
Thorn apple	<i>Datura Stramonium</i> , L., Asia.	"	Annual, 2-4 ft.	July-Oct.	Sept.-Oct.
FIGWORT FAMILY.					
Mullein	<i>Verbascum Thapsus</i> , L., Europe.	"	Biennial, 3-6 ft.	July-Sept	Aug.-Nov
Moth mullein	<i>Verbascum Blattaria</i> , L., Europe.	Eastern Canada.	2 or 3 years, 3 ft.	June-Sept	July-Nov.
Toad-flax, butter and eggs, ramsted.	<i>Linaria vulgaris</i> , Mill., Europe.	"	Perennial, 1 ft.	July-Oct.	Aug.-Nov
Neckweed, purslane speedwell.	<i>Veronica peregrina</i> , L., native.	General ..	Annual and wint. ann., 4-9 in.	May-July	June-Aug
Thyme-leaved speedwell.	<i>Veronica serpyllifolia</i> , L., native.	"	Perennial, creeping, stems ascending.	"	"
Yellow rattle.....	<i>Rhinanthus Crista-galli</i> , L., native and introduced.	Eastern Canada and B.C.	Annual, 6-12 in.	July.....	July-Aug
VERVAIN FAMILY.					
Blue vervain, Simpson's joy.	<i>Verbena hastata</i> , L., native.	General ..	Perennial, 2-3 ft.	June-Sept	Aug.-Oct.
White vervain, nettle-leaved vervain.	<i>Verbena urticifolia</i> , L., native.	Eastern Canada.	"	"	"
MINT FAMILY.					
Wild bergamot.....	<i>Monarda fistulosa</i> (and var. <i>mollis</i>), L., native	Prairie Provinces, Ontario.	Perennial, 2 ft.	July-Aug.	Aug.
Dragon-head	<i>Dracopcephalum parviflorum</i> , Nutt., native.	General ..	Annual, 12-18 in.	June-Aug	July-Aug
Heal-all, self-heal ...	<i>Brumelia vulgaris</i> , L., Europe.	"	Perennial, 4-8 in.	June-Sept	July-Sept

Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of propagation and Distribution.	Place of Growth and Products Injured.	Methods of Eradication.
Blue, $\frac{1}{2}$ in., axillary; very rough-bristly.	Seeds.....	Cultivated land...	Hoe, cultivate.
Whitish, $\frac{1}{2}$ in., axillary.....	Seeds, in grain ...	Grain fields.....	Sow clean seed, plough stubble early
Blue, $\frac{1}{2}$ in., axillary, on leafy racemes.	Seeds, carried by animals.	Grain fields, roadsides, wool.	Summer fallow, cultivate.
Reddish purple, $\frac{1}{2}$ in., racemes	" " ..	" " ..	Spad, mow.
Pink, 1 in., solitary; flowering very sparsely.	Seeds, in grain, long root stocks.	Fields, all crops...	Plough, cultivate frequently.
Pink or white, 2 in., solitary.	Seeds, running root stocks.	Fields.....	Cultivate frequently.
Whitish, $\frac{1}{2}$ in., clusters along orange stem.	Seeds, in clover and alfalfa seed.	Clover and alfalfa fields.	Use clean seed, mow patches before seeds ripen.
White or lilac, $\frac{1}{2}$ in., umbel-like clusters.	Seeds.....	Fields, gardens, all crops.	Cultivate, hoe.
White, 2 in., solitary; plant green.	"	Waste places; poisonous.	Mow, hoe.
Yellow, $\frac{1}{2}$ in., spike; leaves velvety white.	Seeds, in hay and clover seed.	Meadows, pastures.	Spad, plough, cultivate.
Yellow or white, 1 in., raceme; leaves smooth.	" " ..	" " ..	Spad, break up sod.
Yellow, $\frac{1}{2}$ in., racemes; unpleasant odour.	Root-stocks, seeds in grass seeds.	Pastures, roadsides	Break up sod, cultivate, seed heavily to clover.
Blue, $\frac{1}{2}$ in., axillary on spikes.	Seeds.....	Low land.....	Cultivate.
" " ..	"	Low lands, lawns..	Cultivate, break up sod.
Yellow, $\frac{1}{2}$ in., spike; calyx membranaceous, much enlarged in fruit.	Seeds, in hay.....	Meadows in low land.	Mow early.
Purple, $\frac{1}{2}$ in., corymbed spikes	Seeds, root stocks.	Low ground, summer fallows, pastures.	Mow, summer fallow, plough.
White, $\frac{1}{2}$ in., spikes	" " ..	" " ..	" "
Purplish, 1 in., whorled heads, strongly scented.	Seeds, running root stocks.	Summer fallows, newly cleared land	Summer fallow early, cultivate.
Lilac, $\frac{1}{2}$ in., terminal spikes	Seeds.....	Summer fallows, grain crops.	Summer fallow early.
Violet, $\frac{1}{2}$ in.; spike of axillary 3-flowered clusters.	Runners, seeds....	Pastures, lawns...	Break up sod.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration.	Time of Flowering	Time of Seeding.
Heap-nettle PLANTAIN FAMILY.	<i>Galeopsis Tetrahit</i> , L., Europe.	General . .	Annual, 1-3 ft.	July-Sept.	July-Sept.
Common plantain . . .	<i>Plantago major</i> , L., native and Europe.	" . .	Perennial, 6-18 in.	June-Sept.	"
Pale plantain	<i>Plantago Rugellii</i> , Decaisne, native.	" . .	" . .	"	"
Rib grass, black plantain, ripple grass . . GOOSEFOOT FAMILY.	<i>Plantago lanceolata</i> , L., Europe.	" . .	" . .	"	"
Lamb's quarters, pigweed, goosefoot, fat-hen.	<i>Chenopodium album</i> , L., Europe and native.	" . .	Annual, 1-3 ft.	June-Nov.	Aug-Nov.
Maple-leaved goosefoot.	<i>Chenopodium hybridum</i> , L., Europe.	" . .	Annual, 1-5 ft.	July-Nov.	"
Bugseed.	<i>Corispermum hyssopifolium</i> , L., native.	Prairie Provinces	Annual, Spreading.	Aug-Oct.	Sept-Oct.
* Russian tumbleweed, Russian thistle.	<i>Salsola kali</i> , L., var. <i>Tragus</i> , Russia.	Southern Manitoba.	Annual, 1-3 ft.	July-Sept.	Aug-Nov.
* Russian pigweed . . .	<i>Axyris amarantoides</i> , L., Russia.	Manitoba.	Annual, 1-4 ft.	"	"
AMARANTH FAMILY.					
Pigweed, redroot, Chinaman's green.	<i>Amarantus retroflexus</i> , L., Tropical America.	General . .	Annual, 1-3 ft.	"	"
Tumbleweed, white pigweed.	<i>Amarantus albus</i> , L., Tropical America.	" . .	Annual, prostrate or ascending.	July-Sept.	Aug-Sept.
Spreading amaranth, fleshy amaranth, low amaranth.	<i>Amarantus blitoides</i> , Watson, native.	Prairie Provinces, Ontario.	" . .	"	"
BUCKWHEAT FAMILY.					
Nodding knotweed, tall persicary.	<i>Polygonum lapathifolium</i> , Ait, native.	General . .	Annual, 1-4 ft.	July-Sept.	Aug-Sept.
Lady's thumb, persicary.	<i>Polygonum Persicaria</i> , L., Europe.	" . .	Annual, 12-18 in., ascending.	"	"
Knotgrass, goosegrass, door-weed.	<i>Polygonum aviculare</i> , L., native, Europe.	" . .	Annual, 12-18 in., prostrate.	"	July-Sept.
Erect goosegrass, whiteman's footstep.	<i>Polygonum erectum</i> , L., native.	Prairie Provinces, Ontario.	Annual, 6-10 in.	"	"
Wild buckwheat, black bind-weed.	<i>Polygonum convolvulus</i> , L., Europe.	General . .	Annual, climber, 1-3 ft.	"	"
White dock	<i>Rumex salicifolius</i> , Weinm, native.	Prairie Provinces.	Perennial, 1-3 ft.	July-Aug.	Aug-Sept.
Curled dock, sour dock, yellow dock.	<i>Rumex crispus</i> , L., Europe.	General . .	Perennial, 1-3 ft.	"	"

Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of propagation and Distribution.	Place of Growth and Products Injured.	Methods of Eradication.
Purplish, $\frac{1}{2}$ in., axillary whorls; stems swollen below joints; bristly.	Seeds.	Rich land, all crops.	Hoe, pull, cultivate.
Spikes dense; pods 7-16 seeded; leaves inclined to lie down.	"	Meadows, pastures, lawns.	Break up sod, spud.
Spikes slender, less crowded than in above; pods 4 seeded; leaves erect, pale yellowish green, purple at base.	Seeds, in clover and grass seeds.	Low meadows.	Break up sod, plough.
Spike thick and dense; black anthers; white pods, 2-seeded; seeds boat-shaped.	Seeds, in hay and in grass and clover seeds.	Meadows, pastures, lawns.	" "
Green, $\frac{1}{2}$ in., panicle; whole plant mealy white.	Seeds, in grain, clover and grass seed.	Rich soil, all crops.	Cultivate.
Green, $\frac{1}{2}$ in., widely branched panicle; whole plant green, smooth.	Seeds, in grain, clover and grass seed.	"	"
Green, $\frac{1}{2}$ in., spikes; a tumble weed.	Seeds, wind.	Sandy fields, all crops.	Summer fallow, cultivate, burn.
Purplish, $\frac{1}{2}$ in., axillary; a tumble weed.	Seeds, wind, floods.	Fields, railway banks, all crops.	Hoe, cultivate, burn.
Green, $\frac{1}{2}$ in., male flowers in terminal spikes, female axillary.	"	Fields, railway banks, all crops.	"
Green, $\frac{1}{2}$ in., panicle of crowded spikes; root pink.	Seeds, in grain and grass seed, wind.	Rich land, everywhere.	Cultivate late, burn.
Green, $\frac{1}{2}$ in., spikes along the whitish stems; a tumble weed.	Seeds, in grain and grass seed, wind.	Rich land, everywhere.	"
Green, $\frac{1}{2}$ in., spikes along the reddish fleshy stems; seeds twice the size of the preceding.	Seeds, in grain and grass seed, wind.	Rich land, where there is some alkali.	"
Pink, $\frac{1}{2}$ in., spikes drooping the stalks rough, with scattered glands.	Seeds, floods.	Rich lowland, grain and other crops.	Hoe, pull, cultivate.
Pink, $\frac{1}{2}$ in., spikes oblong, erect on smooth stalks; leaves with a black blotch.	"	Rich lowland, grain and other crops.	"
Pink $\frac{1}{2}$ in., axillary along the stems.	"	Rich lowland, grain and other crops.	Hoe, cultivate.
Pink and green, $\frac{1}{2}$ in., axillary along the stems.	"	Rich lowland, grain and other crops.	"
White, $\frac{1}{2}$ in., racemes.	Seeds, in grain.	Grain fields, summer-fallows.	Summer fallow early, cultivate.
Green, $\frac{1}{2}$ in., panicle; seed valves with conspicuous white grains; leaves not waved, pale green.	Seeds, in hay in clover and grass seeds, wind.	Summer fallows, low fields, pastures.	Summer fallow, spud, cultivate.
Green, $\frac{1}{2}$ in., panicle; leaves waved at margin.	Seeds, in hay in clover and grass seeds, wind.	Cultivated waste land, pastures.	Spud, plough.

A LIST of the more prominent Canadian

Common Name.	Botanical Name, Origin.	Where Injurious.	Duration.	Time of Flowering	Time of Seeding.
BUCKWHEAT— <i>Con.</i>					
Sheep sorrel, sour grass, sour weed.	<i>Rumex acetosella</i> , L., Europe.	General...	Perennial, 6-12 in.	May-Oct.	June-Nov.
OLEASTER FAMILY.					
Wolf willow, silver-berry.	<i>Eleagnus argentea</i> , Nutt., native.	Prairie Provinces.	Shrub, 2-6 ft.	June.....	August...
SPURGE FAMILY.					
Spotted spurge, milk purslane.	<i>Euphorbia maculata</i> , L., native.	General ..	Annual, prostrate.	July-Sept.	Aug-Sept.
Sun spurge, milk-wort.	<i>Euphorbia Helioscopia</i> , L., Europe.	Eastern Canada, B.C.	Annual, 6-18 in.	June-Oct.	July-Oct.
NETTLE FAMILY.					
Slender nettle.	<i>Urtica gracilis</i> , Ait., native.	Eastern Canada.	Perennial, 2-6 ft.	June-Sept.	July-Nov.
GRASS FAMILY.					
Fool's hay, hair-grass.	<i>Agrostis scabra</i> , Willd., native.	General ..	Annual, 1-2 ft.	July.....	July Aug.
*Spear grass, porcupine grass.	<i>Stipa spartea</i> , Trin., native.	Prairie Provinces.	Perennial, 12-18 in.	July 1-15.	July 10-20
*Chess	<i>Bromussecalinus</i> , L., Europe.	General ..	Winter annual, 1½-3ft.	June.....	July.....
Couch, quack, skutch, twitch, devil's grass	<i>Agropyrum repens</i> , L., Europe and native.	" ..	Perennial, 1½-3 ft.	June-July	Aug-Sept.
*Skunk grass, skunk tail grass, squirrel tail grass, wild barley, alkali grass.	<i>Hordeum jubatum</i> , L., native.	Prairie Provinces.	Annual, and perennial, 6-12 in.	July-Oct.	July-Oct.
White-top, old fog..	<i>Danthonia spicata</i> , Beauv., native.	Maritime Provinces, Quebec.	Perennial, 6-12 in.	June-July	July-Aug.
*Wild oats.....	<i>Avena fatua</i> , L. (and <i>A. strigosa</i>), Europe.	General ..	Annual, 2-3 ft.	July.....	"
*Sweet grass, Indian hay, holy grass.	<i>Hierochloa borealis</i> , R. & S., native.	Manitoba, N.W.T.	Perennial, 12-15 in.	May.....	June.....
Old witch grass....	<i>Panicum capillare</i> , L., native.	General ..	Annual, 12-18 in.	July-Aug.	July-Aug.
Green foxtail, bottle grass, pigeon grass.	<i>Setaria viridis</i> , Beauv., Europe.	" ..	Annual, 1-2 ft.	July-Sept.	Aug-Oct.
Yellow foxtail	<i>Setaria glauca</i> , Beauv., Europe.	" ..	Annual, 1 ft. ascending.	"	"
FERNS.					
Western brake, bracken.	<i>Pteris aquilina</i> , L., var. <i>lanuginosa</i> , Bong., native.	British Columbia.	Perennial, 3-8 ft.	Summer..	Summer.
Scented fern, brakes.	<i>Diaksonia pilosiuscula</i> , Willd., native.	Quebec...	Perennial, 1-2 ft.	"	"

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Weeds, with their chief characters—*Continued.*

Colour, Size, Arrangement of Flowers and other Characters of the Plant.	Method of propagation and Distribution.	Place of Growth and Products Injured.	Method of Eradication.
Red, $\frac{1}{2}$ in., panicle	Running rootstocks seed, in clover seed.	Meadows, worn-out pastures, sandy land.	Break up sod, fertilize, re-seed.
Yellow, $\frac{1}{2}$ in., very fragrant.	Seeds, running roots.	Pastures.....	Break early, cultivate
Red, $\frac{1}{2}$ in., dense leafy axillary clusters.	Seeds.....	Sandy land, gardens, all crops.	Cultivate, seed down.
Yellowish, cyme; pod smooth	"	Gardens, fields, all crops.	Hoe, cultivate.
Green, $\frac{1}{2}$ in., panicle.	Seeds, running rootstocks.	Low land, pastures, fence-rows.	Mow frequently.
Panicle very loose, purplish; leaves very short.	Seeds, wind.	Summer-fallows ..	Summer fallow early.
Panicle contracted, awns, 4 to 6 inches long, blackish.	Seeds, carried by animals.	Prairie, seeding freely in wet seasons.	Break up prairie.
Spikelets dark green.....	Seeds, in grain....	Fall wheat and rye	Sow clean seed.
Spikes	Seeds, rootstocks carried by cultivating implements.	Fields, all crops...	Plough shallow in summer, hoed crops
Pale green, sometimes purplish by cold weather; spikes; flowers long-awned (2 in.)	Seeds, wind, animals.	Meadows, pastures, the barbed seeds injuring stock when eaten.	Mow, burn, break land.
Panicle simple; leaves short, gray, curled.	Seeds.	Pastures and meadows.	Break up sod.
Seed hairy and bearing a long twisted awn.	Seeds, in seed grain	Fields, grain crops.	Seed down with early barley or oats and cut for hay, follow with rape or millet.
Spikelets brown; whole plant sweetly scented.	Seeds, running rootstocks.	Fields, all crops...	Plough deep, cultivate often.
Panicle large, loose and very compound; sheaths and leaves very hairy.	Seeds, wind.	Cultivated land, all crops.	Hoe, cultivate.
Spike nearly cylindrical, green.	Seeds, in clover and grass seeds.	Cultivated land, all crops.	Hoe, pull, cultivate.
Spike cylindrical; stems more spreading, seeds larger than in last.	Seeds, in clover and grass seeds.	Cultivated land, all crops.	"
Fronds very large; white downy beneath.	Spores, running rootstocks.	Newly cleared land	Grub and plough early in spring, harrow, cultivate.
Forming large beds which rapidly encroach on pastures.	Spores, running rootstock.	Mountain pastures	Break up sod.

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<i>Hordium</i>	38	Pigeon Weed	34
Horse-weed	23	Pigweed	36
Hound's-tongue	18, 34	" Russian	36
<i>Hypericum</i>	24	" White	36
		Pingress	26
Indian Hay	21, 38	Pitch-forks	30
Indian Hemp	32	<i>Plantago</i>	36
Indian Tobacco	32	Plantain, Black	36
<i>Iva</i>	28	" Common	36
		" Pale	36
Ketmia, Bladder	24	<i>Polygonum</i>	36
Knapweed	30	Porcupine Grass	38
Knotgrass	36	<i>Portulaca</i>	24
Knotweed, Nodding	36	<i>Potentilla</i>	26
		Poverty Weed	28
Lady's Thumb	6	Prairie Rocket	22
<i>Laduca</i>	32	<i>Pteris</i>	38
Lamb's Quarters	36	Purslane	24
<i>Leonodon</i>	32	Pusley	24
<i>Lepidium</i>	24		
Lettuce, Blue	32	Quack	38
" Prickly	32		
" Showy	32	Ragweed	28
<i>Linaria</i>	34	" Common	30
Liquorice, Wild	26	" False	28
<i>Ethospermum</i>	34	" Great	28
Live-forever	26	" Perennial	30
<i>Lobelia</i>	32	Ramsted	34
<i>Lychnis</i>	24		

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<i>Rudbeckia</i>	30		
<i>Rumex</i>	36, 38	<i>Taraxacum</i>	32
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<i>Setaria</i>	38	Russian.....	36
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ERRATA.

On page 23, line 18 from bottom, read above, instead of No. 13.

" 24, transfer Mouse-ear Chickweed, Field Chickweed, and Corn Spurry to the Pink Family above.

" line 8, from bottom, read Field Chickweed,

" " 4 " Corn Spurry.

" " 2 " Bladder Ketmia.

" 28 " 29, from top, read *Erigeron strigosus*.

" 30 " 12, from bottom, read *Erechtites*.

" " 5 " Stinking Billy or Stinking Willie.

" 34 " 5, from top, read Borage Family—*Con.*, for *Convolvulus—Con.*

